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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/025,465	12/26/2001	Toshiyuki Kambe	PNDF-01211	2962

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YOUNG & THOMPSON
745 SOUTH 23RD STREET 2ND FLOOR
ARLINGTON, VA 22202

EXAMINER

LIN, TINA M

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 08/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/025,465

Applicant(s)

KAMBE, TOSHIYUKI

Examiner

Tina M Lin

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, and 11 is/are rejected.
- 7) ☒ Claim(s) 8 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

This Office action is responsive to applicant's communication filed on 16 July 2003.

The applicant's arguments have been carefully studied and re-evaluated by the examiner. The arguments advanced therein, considered together with the amendments made to the claims, are persuasive and the rejections based upon prior art made of record in the previous Office Action are withdrawn. In view of further search, however, and the consequent discovery of relevant prior art documents, a new rejection is set forth. This action is **not** made final.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 7 recites the limitation "said third thin film layer" in the last line of the claim.

There is insufficient antecedent basis for this limitation in the claim. Claim 7 is dependent on Claim 1, and there is no mention of a third conductive layer in claim 1. However, for examination purposes, the examiner has examined the claim as if claim 1 recited a third conductive thin film.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.

Patent 6,400,881 B1 to Seino et al. Seino et al. discloses an optical waveguide with a substrate

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(10) and two conductive thin film layers (21 and 22) placed on top of at least one optical waveguide (11 and 12). One of the thin films is a transparent thin film (22) and the other is a metal thin film (21). (Figure 7 and 15) Seino further discloses that the second layer (21) is made of gold. (Column 8) But Seino et al. fails to mention in the embodiment of Figure 7 that the first conductive layer is to contain of indium oxide. However, Seino et al. does previously disclose that the thin film could be made of indium oxide. (Column 7 and Figure 6) Further, indium tin oxide can be a transparent conductive material. (US2002/0153149 A1 to Okeda et al., paragraph [0117]) Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have used indium oxide as the material for the first conductive layer.

Claims 5-6, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,400,881 B1 to Seino et al. and in further view of Applicant's own admitted prior art in the "Background of the Invention" and Prior Art Figure 2. Seino et al. discloses an optical waveguide with a substrate (10) and two conductive thin film layers (21 and 22) placed on top of at least one optical waveguide (11 and 12). One of the thin films is a transparent thin film (22) and the other is a metal thin film (21). (Figure 7 and 15) But Seino et al. fails to disclose a third conductive thin film layer to be gold. However, in prior art Figure 2, applicant shows a third conductive layer to be gold. The third conductive layer of gold is to ease the connection between the electrodes and wire bonding. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have used a third layer to be made of gold.

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Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,400,881 B1 to Seino et al. as applied to claim 1 above, and in further view of US2002/0153149 A1 to Okeda et al. Seino et al. discloses all discussed above, but fails to disclose a thin film layer that contain chromium. However, Okeda et al. discloses a waveguide with thin film layers on a substrate. In Figure 1, Step F, Okeda et al. discloses thin film layer that can contain copper or another alloy. According to Okeda et al., a possible substitute alloy can be chromium. ([0117]) Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have used chromium in a conductive thin layer of a waveguide.

Claim 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,400,881 B1 to Seino et al. as applied to claim 1 above, and in further view of U.S. Patent 5,483,609 to Nakaya. Seino et al. discloses all discussed above, but fails to disclose a protective film formed over the conductive layers of the optical waveguide device. However, Nakaya does disclose a protective film formed over the exposed surfaces of each of the thin film layers for the purpose of protection. (Figure 6) Since both layers are used for the purpose of protecting the thin film layers, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have used a protective film over the thin layers for protection.

Allowable Subject Matter

Claims 8 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In regards to claim 8, the prior art of record fails to disclose or reasonably suggest an optical waveguide device with a lithium niobate substrate, optical waveguides in the substrate to form Mach-Zehnder type couplers and a phase shifter formed

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between the couplers. The closest prior art of record is U.S. Patent 5,483,609 to Nakaya discloses an optical waveguide device with a lithium niobate substrate and a Mach Zehnder coupler, but fails to disclose a phase shifter formed between the Mach Zehnder couplers. In regards to claim 10, the prior art of record fails to disclose or reasonably suggest the combination of a first thin film layer containing indium oxide and the second thin film layer containing chromium. By this combination, the waveguide device will be able to work at a higher atmosphere temperature and prevent an ion flux and a short circuit at these high temperatures.

Claim 12 is allowed. The prior art of record fails to disclose or reasonably suggest a process to produce an optical waveguide structure comprising all of the steps as disclosed by applicant. The closest prior art of record is U.S. Patent 5,483,609 to Nakaya discloses a process of producing an optical waveguide structure but fails to disclose an indium oxide thin film layer, forming a photoresist mask and forming a chromium thin film thinner than the indium oxide layer.

Applicant's arguments, see paper number 4, Amendment "A", filed 16 July 2003, with respect to Claims 1-12 have been fully considered and are persuasive. The previous rejections of Office action mailed 17 April 2003; paper number 3 has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made as discussed above. Additionally, upon further examination, the previously allowed subject matter of claims 5, 6, 9, and 11 are rescinded. The Examiner apologizes for any inconvenience or confusion this may have caused.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tina M Lin whose telephone number is (703) 305-1959. The examiner can normally be reached on Monday-Friday 8:30-5:30.

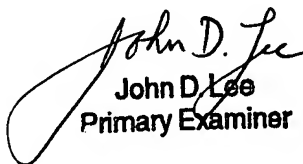
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (703) 308-4819. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TML

August 11, 2003


John D. Lee
Primary Examiner